What is claimed is:

1. A motion-adaptive interpolation method comprising:

receiving a continuous field data, estimating horizontal directional inter-frame motion information of a field to be currently interpolated and outputting the estimated motion information; and

calculating and outputting a line interpolation value by applying a rule and filtering according to the estimated motion information.

2. The method of claim 1, wherein the continuous field data includes two past field data, one current field data and one future field data.

3. The method of claim 1, wherein the step of estimating horizontal directional motion information of a field comprises:

receiving a continuous field data and setting a basic unit image region based on a pixel to be interpolated;

obtaining a block matching error (BME) by moving tha basic unit image region at certain intervals in a horizontal direction of a mutually opposite direction; and

outputting a temporally linear-interpolated value according to a direction corresponding to a position of the pixel to be currently interpolated and pixel values of an adjacent field (a previous and a next pixels) used for the linear interpolation, by using the block matching error having a minimum value for each pixel to be interpolated

4. The method of claim 3, wherein the line interpolation value is calculated in a manner that the block matching error, the linear-interpolated value and the previous and next pixel values used for the linear interpolation are received and a final interpolation value is calculated by using a rule and filtering, and then a line interpolation is performed by using the calculated value.

5. The method of claim 3, wherein the step of setting a basic unit image region comprises:

combining the field data with adjacent field data to form two frame image blocks.

6. The method of claim 3, wherein, in the step of setting a basic unit image region, a continuous field data is received to detect interframe motion information, and a horizontal directional motion is estimated from the motion information to set a basic unit image region.

7. The method of claim 3, the number of pixels of the basic unit image region is 'the number of vertical directional pixels x the number of horizontal directional pixels, wherein the number of the vertical directional pixels is 3 and the number of horizontal directional pixels are variably set by a user.

8. The method of claim 1, further comprising the steps of:

receiving an input image signal, and storing and outputting a field data;

receiving the field data, detecting and outputting an inter-field motion amount value and inter-frame motion amount value;

improving a reliability of the detected motion and outputting a motion amount value; and

estimating an edge direction of a field image to be currently interpolated.

9. The method of claim 8, wherein the rule and filtering are performed in a manner that:

in case of an accurate motion estimation, a temporal motion compensation is performed,

in case of a vague motion estimation, a pixel value blended according to a temporal motion estimation and spatial edge direction estimation is used to be performed; and

in case of an inaccurate motion estimation, a pixel value interpolated according to a spatial edge direction estimation is performed and a filtering is performed according to a slope of the estimated edge direction.

10. A motion-adaptive interpolation apparatus comprising:

a horizontal directional motion estimating means for receiving a continuous field data and setting a basic unit image region by estimating a horizontal directional motion, obtaining a block matching error (BME) by moving the basic unit image region at certain intervals in a horizontal direction of mutually opposite direction, and detecting a linear-interpolated pixel value by using the block matching error and outputting the detected pixel value; and

a line interpolating means for receiving an output value from the horizontal directional motion estimating means and calculating a final interpolation value.

11. The apparatus of claim 10, wherein the field data includes two past fields, one current field and one future field.

12. The apparatus of claim 10, wherein the basic unit image region detects inter-frame motion information of the field data and estimates a horizontal directional motion from the motion information.

13. The apparatus of claim 10, wherein the number of pixels of the basic unit image region is 'the number of vertical directional pixels x the number of horizontal directional pixels, wherein the number of the vertical directional pixels is 3 and the number of horizontal directional pixels are variably set by a user.

14. The apparatus of claim 10, wherein the linearly interpolated pixel value includes a temporally motion compensated interpolation value as the output of the horizontal directional motion estimating means, a temporal block matching error at that time, and previous and next pixel values used for the temporal motion compensation.

15. The apparatus of claim 10, further comprising:

a motion detecting means for receiving the continuous field data and detecting an inter-frame motion amount and an inter-field motion amount;

a post-processing means for filtering the detected motion amount and outputting a precise motion amount value by extending the filtered signal; and

an edge direction detecting means for receiving the continuous field data, estimating a direction of edges of the field image to be interpolated, and

performing an interpolation according to the direction.

16. The apparatus of claim 15, wherein, in detecting the inter-frame motion amount, a motion amount between fields existing at the same phase with temporal intervals of one frame or of a plurality of frames from the field data, and in detecting the inter-field motion amount, a motion amount between fields existing at different phases with temporal interval of one field from the field data.

17. The apparatus of claim 15, wherein the filtered signal is a signal obtained in a manner that, a brightness difference signal outputted from the motion detecting means is low-pass filtered, the filtered signal is mapped to a predetermined level, and the mapped signal is median-filtered.

18. The apparatus of claim 15, wherein the line interpolating means receives output information of the post-processing means, the horizontal directional motion estimating means and the edge direction detecting means, and obtains a final interpolation value in consideration of the influence of the block matching error value and the pixel value used for the temporal motion compensation.

19. A motion-adaptive interpolation apparatus comprising:

a field data providing means for receiving an input image signal and storing and outputting field data;

a motion detecting means for receiving the continuous field data from the field data providing means and detecting an inter-field and inter-frame motion

amount;

a post-processing means for improving a reliability of the detected motion;

a horizontal directional motion estimating means for estimating a motion in a horizontal direction, obtaining a block matching error by moving a basic unit image region for a motion estimation at certain intervals in a different horizontal direction in order to perform a temporal compensation for a case that there is a motion in the direction, and detecting a linear-interpolated pixel value;

an edge direction detecting means for receiving a field data and a horizontal line data from the field data providing means and detecting an edge direction; and

a line interpolating means for receiving output information of the post-processing means, the horizontal directional motion estimating means and the edge direction detecting means, and obtaining a final interpolation value by using a rule and filtering in consideration of an influence of a block matching error value and a pixel value used for a temporal motion compensation.

20. The apparatus of claim 19, wherein the data value inputted for the rule and filtering includes:

a motion amount value obtained from the post-processing means;

a pixel spatially positioned at a very upper and a very lower side of the pixel to be currently interpolated and pixels of a previous and next fields existing spatially at the same position as that of the pixel being currently interpolated, both obtained from the field data providing means; and

spatial linear interpolation value according to the edge direction obtained from the edge direction detecting means, a spatial block matching error at that

time, and pixels used for a spatial linear interpolation; and

temporal motion compensated interpolation value obtained from the horizontal directional motion estimating means, a temporal block matching error at that time, and a pixel value used for a temporal motion compensation.